What is claimed is:

1. An optical fiber amplifier assembly, comprising:

a support board;

a first pluggable sub-unit mounted onto said support board, said first pluggable sub-unit comprising a first pump source having a pump wavelength of λ_1;

a second pluggable sub-unit mounted onto said support board, said second pluggable sub-unit comprising a plurality of first stage optical signal amplifying components;

a third pluggable sub-unit mounted onto said support board, said third pluggable sub-unit comprising a plurality of input stage components; and

a fourth pluggable sub-unit mounted onto said support board, said fourth pluggable sub-unit comprising a plurality of output stage components;

said second pluggable sub-unit being optically connected to each of said first, third and fourth pluggable sub-units.

2. The optical amplifier assembly of claim 1, wherein said second pluggable sub-unit is optically connected to each of said first, third and fourth pluggable sub-units via a first, third and fourth board mountable fiber-optic connector, respectively.

3. The optical amplifier assembly of claim 1, wherein said second pluggable sub-unit comprises a plurality of second stage optical signal amplifying components.

4. The optical amplifier assembly of claim 3, further comprising a fifth pluggable sub-unit mounted onto said support board, said fifth pluggable sub-unit having a second pump source that has a pump wavelength of λ_2 and which is optically connected to said second pluggable sub-unit via a fifth board mountable fiber-optic connector.

5. The optical amplifier assembly of claim 4, wherein said plurality of first and second stage optical signal amplifying components comprises in a direction of an optical signal transmission a first wavelength-division multiplexing coupler serially

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connected to a first rare-earth doped optical fiber coil, said first rare-earth doped optical fiber coil being serially connected to a first optical isolator, said first optical isolator being serially connected to a gain flattening filter, said gain flattening filter being serially connected to a second wavelength-division multiplexing coupler, said second wavelength-division multiplexing coupler being serially connected to a second rare-earth doped optical fiber coil.

6. The optical amplifier assembly of claim 4, wherein said pump wavelength λ_1 of said first pump source is approximately equal to said pump wavelength λ_2 of said second pump source.

7. The optical amplifier assembly of claim 4, wherein said pump wavelength λ_1 of said first pump source is different than that of said pump wavelength λ_2 of said second pump source.

8. The optical amplifier assembly of claim 6, wherein each of said pump wavelength λ_1 and λ_2 is approximately 980 nanometers.

9. The optical amplifier assembly of claim 7, wherein said pump wavelength λ_1 of said first pump source is 980 nanometers and wherein said pump wavelength λ_2 of said second pump source is 1480 nanometers.

10. The optical amplifier assembly of claim 9, wherein said plurality of input stage components comprises in said direction of said optical signal transmission a first tap coupler, and a first photodetector serially connected to said tap coupler.

11. The optical amplifier assembly of claim 10, wherein said plurality of input stage components further comprises in said direction of said optical signal transmission a second optical isolator serially connected to a supervisory channel drop unit, a receiver serially connected to said supervisory channel drop unit, a variable optical attenuator

serially connected to said supervisory channel drop unit at a first end and to said first tap coupler at an opposite end.

12. The optical amplifier assembly of claim 11, wherein said plurality of output stage components comprises in said direction of said optical signal transmission:

a second tap coupler, and a second photodetector serially connected to said second tap coupler.

13. The optical amplifier assembly of claim 12, wherein said plurality of output stage components further comprises in said direction of said optical signal transmission: a third optical isolator serially connected to said second tap coupler, a supervisory channel add unit serially connected to said third optical isolator and a transmitter serially connected to said supervisory channel add unit.

14. The optical amplifier assembly of claim 13, wherein each of said first, third, fourth and fifth board mountable fiber-optic connectors comprises a respective first-half member and a respective mating second-half member, each of said respective first-half members being mounted along an edge of each of said first, third, fourth and fifth pluggable sub-unit, respectively, and each of said respective mating second-half members being mounted along the edges of said second pluggable sub-unit.

15. A method of making an optical fiber amplifier comprising the steps of:

providing a plurality of different pump sub-units, different optical signal amplifying sub-units, different input sub-units and different output sub-units;

selecting one desired sub-unit from each of said plurality of different pump sub-units, different optical signal amplifying sub-units, different input sub-units and different output sub-units;

optically connecting each of said desired pump, optical signal amplifying, input and output sub-units on a support board via a plurality of pluggable fiber optic connectors to make said optical fiber amplifier.

16. The method of claim 15, wherein said providing step includes the step of first providing a design for each of a first, second, third and fourth optical fiber amplifier, each of said first, second, third and fourth optical fiber amplifier comprising a plurality of optical components.

17. The method of claim 16, wherein said first providing step further includes: for each of said first, second, third and fourth optical fiber amplifier, dividing said plurality of optical components into at least four functional groups, including a pump components group, an optical signal amplifying components group, an input components group and an output components group, each of said functional groups comprising one or more optical components.

18. The method of claim 17, wherein said pump components group is further divided into a first pump components group and a second pump components group, said first pump components group including a first pump laser having an output wavelength of λ_1, said second pump components group including a second pump laser having an output wavelength of λ_2.

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19. The method of claim 17, further comprising the steps of:

forming an optical signal amplifying components group, an input components group and an output components group, wherein each of said optical signal amplifying, input and output components groups includes a maximum number of said optical components common to each of said first, second, third and fourth optical fiber amplifiers; and

forming an optical signal amplifying subset components group, an input subset components group and an output subset components group, each of said subset components groups having the minimum number of said optical components common to each of said respective components groups for each of said first, second, third and fourth optical fiber amplifiers.

20. The method of claim 18, further comprising the steps of:

mounting each of said optical signal amplifying components group formed on one or more amplifying sub-units, mounting each of said input components group formed on one or more input sub-units, and mounting each of said output components group formed on one or more output sub-units;

mounting each of said optical signal amplifying components subset group formed on one or more amplifying sub-units, mounting each of said input components subset group formed on one or more input sub-units, and mounting each of said output components subset group formed on one or more output sub-units;

and

mounting each of said first pump components group and said second pump components group on a first pump sub-unit and a second pump sub-unit, respectively.

21. The method of claim 20, further comprising the step of:

arranging each of said optical signal amplifying, input and output components groups and each of said optical signal amplifying, input and output subset components groups on said respective sub-units such that an optical fiber splice between any two of said optical components provides a low-loss and a high strength splice.

22. The method of claim 21, wherein said step of optically connecting comprises:

mounting on an edge of each of said pump sub-units, each of said input sub-units, and each of said output sub-units a first-half member of a board mountable fiber-optic connector that is adapted for mating with a respective second-half member mounted on each of said optical signal amplifying sub-units.

23. The method of claim 22, wherein said optically connecting step further comprises the step of:

first determining which of said optical components on each of said optical signal amplifying, input and output sub-units utilize similar fibers and which of said optical components on each of said optical signal amplifying, input and output sub-units utilize different fibers for each of said first, second, third and fourth optical fiber amplifiers; and

providing optical interfaces between said desired sub-units selected to be optically connected such that each of said optical interfaces provides a low-loss and a high-strength optical fiber splice.

24. The method of claim 23, wherein said step of optically connecting comprises mounting on each of said pump sub-units a first-half member of a first and a second board mountable fiber-optic connector, each first-half member having a first type of an optical fiber and mounting on each of said optical signal amplifying sub-units two second-half members of said first and said second board mountable fiber-optic connector, each second-half member being adapted for mating with said first-half members.

25. The method of claim 24, wherein said step of optically connecting comprises mounting on each of said input sub-units a first-half member of a third board mountable fiber-optic connector having a second type of an optical fiber and mounting on each of said optical signal amplifying sub-units a second-half member adapted for mating with said first-half member on said input sub-units.

26. The method of claim 25, wherein said step of optically connecting comprises mounting on each of said output sub-units a first-half member of a fourth board mountable fiber-optic connector that contains an optical fiber of said second type and mounting on each of said optical signal amplifying sub-units a second-half member adapted for mating with said first-half member on said output sub-units.

27. The method of claim 26, wherein said first optical fiber amplifier is a line amplifier.

28. The method of claim 26, wherein said second optical fiber amplifier is an input amplifier having a first net gain.

29. The method of claim 26, wherein said third optical fiber amplifier is an output amplifier.

30. The method of claim 26, wherein said fourth optical fiber amplifier is an input amplifier having a second net gain.

31. The method of making an optical fiber amplifier, comprising the steps of:

arranging on a first pluggable sub-unit a first pump source having a first pump wavelength of λ_1, said first pluggable sub-unit having mounted on an edge a first-half member of a first board mountable fiber-optic connector adapted for mating with a corresponding second-half member mounted on a first edge of a second pluggable sub-unit;

arranging on said second pluggable sub-unit a first group of optical components that effect each of a first signal amplifying stage, a second signal amplifying stage, and the gain flatness of said optical fiber amplifier, said first group of optical components providing said optical fiber amplifier with a first net gain, said second pluggable sub-unit having mounted on said first edge said second-half member of said first board mountable fiber-optic connector and said second sub-unit having mounted on a second edge a second-half member of each of a third and fourth board mountable fiber-optic connectors;

arranging on a third pluggable sub-unit a second group of optical components that effect an input stage of said optical fiber amplifier, said third pluggable sub-unit having mounted on an edge a first-half member of said third board mountable fiber-optic connector adapted for mating with said respective second-half member mounted on said second pluggable sub-unit;

arranging on a fourth pluggable sub-unit a third group of optical components that effect an output stage of said optical fiber amplifier, said fourth pluggable sub-unit having mounted on an edge a first-half member of said fourth board mountable fiber-optic connector adapted for mating with said respective second-half member mounted on said second pluggable sub-unit;

arranging on a fifth pluggable sub-unit a second pump source having a second pump wavelength of λ_2, said fifth pluggable sub-unit having mounted on an edge a first-half member of a fifth board mountable fiber-optic connector adapted for mating with a corresponding second-half member mounted on said first edge of said second pluggable sum-assembly; and

optically connecting each of said first, third, fourth and fifth pluggable sub-units into said second pluggable sub-unit via said respective first, third, fourth and fifth board mountable fiber-optic connectors to make said optical fiber amplifier.

32. The method of claim 31, further comprising the steps of:

substituting for said second pluggable sub-unit a sixth pluggable sub-unit which includes a fourth group of optical components that effect each of a first signal amplifying stage, a second signal amplifying stage, and the gain flatness of said optical fiber amplifier, said fourth group of optical components providing said optical fiber amplifier with a second net gain, said sixth pluggable sub-unit having mounted on a first edge a second-half member of each of a first and fifth board mountable fiber-optic connectors and said sixth pluggable sub-unit having mounted on a second edge a second-half member of each of a seventh and eighth board mountable fiber-optic connectors;

substituting for said third pluggable sub-unit a seventh pluggable sub-unit which includes a fifth group of optical components that effect an input stage of said optical fiber amplifier, said fifth group being a sub-set of said second group of optical components, said seventh pluggable sub-unit having mounted on an edge a first-half member of said seventh board mountable fiber-optic connector; and

substituting for said fourth pluggable sub-unit an eighth pluggable sub-unit which includes a sixth group of optical components that are shared in an output stage of said optical fiber amplifier, said sixth group being a sub-set of said third group of optical components; said eighth pluggable sub-unit having mounted on an edge a first-half member of said eighth board mountable fiber-optic connector;

whereby said first, fifth, seventh and eighth pluggable sub-units are optically connected to said sixth pluggable sub-unit via said respective first, fifth, seventh and eighth board mountable fiber-optic connectors to make a different optical fiber amplifier.

33. The method of claim 32, wherein said optical fiber amplifier comprises:

one of said second and sixth pluggable sub-units that is optically connected to at least one of said first and fifth pluggable sub-units, one of said third and seventh pluggable sub-units and one of said fourth and eighth pluggable sub-units.

34. The method of claim 33, wherein each of said first, third, fourth, fifth, seventh and eighth board mountable fiber-optic connectors couple optical components constructed with similar optical fibers.

35. A method of making an optical fiber amplifier comprising the steps of:

testing the pump power and pump wavelength of a pump module to be connected to an information signal to be amplified;

if the desired pump power and pump wavelength are not present, rejecting said pump module for use in a larger assembly;

if the desired pump power and pump wavelength are present, accepting said pump module for use in a larger assembly;

assembling a signal input module having an input end to be connected to an information signal to be amplified and an output end that terminates in a plug connector;

connecting said signal input module to a source of a known signal representative of an information carrying signal;

measuring the signal present at said output end;

if the desired signal is not present at said output end, rejecting said input module for use in a larger assembly;

if the desired signal is present at said output end, accepting said input module for use in a larger assembly;

assembling a signal output module having an input end to be connected to an information signal to be amplified and an output end that terminates in a plug connector;

connecting said signal output module to a source of a known signal representative of an information carrying signal;

measuring the signal present at said output end;

if the desired signal is not present at said output end, rejecting said output module for use in a larger assembly;

if the desired signal is present at said output end, accepting said output module for use in a larger assembly;

assembling a signal amplifying module including at least an amplifying stage and having an input end and an output end, said input end of said signal amplifying module being connected to a coupler that has a pump input fiber and a signal input fiber and an output fiber;

providing a test information signal to said signal input fiber;

providing pump power to said amplifying stage through said power input fiber;

measuring the signal at the output end of said signal amplifying module;

if the desired signal is not present at said output end, rejecting said signal amplifying module for use in a larger assembly;

if the desired signal is present at said output end, accepting said signal amplifying module for use in a larger assembly;

mounting an accepted signal-amplifying module, an accepted input module, an accepted output module and an accepted pump module on a substrate;

optically connecting each of said input module, output module and pump module to said signal amplifying module; and

testing each of said modules on said substrate.

36. The method of claim 35, further comprising mounting a second accepted pump module having a pump wavelength of λ_2 on said substrate;

optically connecting said second accepted pump module to said accepted signal amplifying module; and

testing said second accepted pump module on said substrate.

37. A method of making n different types of optical amplifiers on one manufacturing line, n being equal to or greater than 2, said method comprising the steps of:

a) for each of the circuits which comprise each of the optical amplifiers to be made, providing a supply of at least four functional groups of sub-units, at least one functional group containing at least n different types of sub-units, each of the sub-units in 3 of said functional groups including a pluggable optical connector half and each of the sub-units of the fourth of said functional groups including 3 pluggable optical connector halves; and,

b) depending on the specification of the optical amplifier to be made, selecting a specific sub-unit from each of said functional groups and plugging together each of said selected sub-units to form an optical amplifier having the desired specification.